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Birmingham Coal & Coke Co., Inc.
Old Union No. 2 Mine, P-3962
Detailed Design Plan Basin 079

5.9 Inches, 10 Year - 24 Hour,

DRN 58

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General Information

Storm Information:

Storm Type:	DRN 58
Design Storm:	10 yr - 24 hr
Rainfall Depth:	5.900 inches

Particle Size Distribution:

Size (mm)	Topsoil	Spoil
3.0000	100.000%	100.000%
2.0000	98.000%	92.000%
1.0000	96.000%	78.000%
0.5000	94.000%	54.000%
0.3000	88.000%	43.000%
0.2000	80.000%	34.000%
0.1000	68.000%	22.000%
0.0500	49.000%	15.000%
0.0300	36.000%	9.000%
0.0200	28.000%	5.000%
0.0100	14.000%	4.000%
0.0050	5.000%	3.000%
0.0030	4.000%	2.500%
0.0010	2.000%	2.000%
0.0001	0.001%	0.001%

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Basin 079

#1
Pond

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc. (ml/l)	24VW (ml/l)
#1	In	13.200	13.200	16.91	4.25	1,256.6	335,348	256.84	150.92
	Out			13.41	4.25	45.0	13,580	0.16	0.09

Particle Size Distribution(s) at Each Structure

Structure #1:

Size (mm)	In	Out
3.0000	100.000%	100.000%
2.0000	92.000%	100.000%
1.0000	78.000%	100.000%
0.5000	54.000%	100.000%
0.3000	43.000%	100.000%
0.2000	34.000%	100.000%
0.1000	22.000%	100.000%
0.0500	15.000%	100.000%
0.0300	9.000%	100.000%
0.0200	5.000%	100.000%
0.0100	4.000%	100.000%
0.0050	3.000%	83.754%
0.0030	2.500%	69.795%
0.0010	2.000%	55.836%
0.0001	0.001%	0.028%

Structure Detail:

Structure #1 (Pond)

Basin 079

Pond Inputs:

Initial Pool Elev:	1,051.70 ft
Initial Pool:	0.48 ac-ft
*Sediment Storage:	0.92 ac-ft
Dead Space:	20.00 %

**Sediment capacity was entered by user*

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
24.00	180.00	2.00	0.0240	1,051.70	0.90	0.00

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
1,054.00	20.00	2.00:1	2.00:1	12.00

Pond Results:

Peak Elevation:	1,054.03 ft
H'graph Detention Time:	0.86 hrs
Pond Model:	CSTRS
Dewater Time:	0.66 days
Trap Efficiency:	96.42 %

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
1,049.64	0.202	0.000	0.000		Top of Sed. Storage
1,049.70	0.204	0.012	0.000		
1,049.80	0.207	0.033	0.000		
1,049.90	0.210	0.054	0.000		
1,050.00	0.213	0.075	0.000		
1,050.10	0.216	0.096	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
1,050.20	0.219	0.118	0.000		
1,050.30	0.222	0.140	0.000		
1,050.40	0.226	0.163	0.000		
1,050.50	0.229	0.185	0.000		
1,050.60	0.232	0.208	0.000		
1,050.70	0.235	0.232	0.000		
1,050.80	0.238	0.255	0.000		
1,050.90	0.242	0.279	0.000		
1,051.00	0.245	0.304	0.000		
1,051.10	0.248	0.328	0.000		
1,051.20	0.252	0.353	0.000		
1,051.30	0.255	0.379	0.000		
1,051.40	0.258	0.404	0.000		
1,051.50	0.262	0.430	0.000		
1,051.60	0.265	0.457	0.000		
1,051.70	0.269	0.483	0.000		Spillway #1
1,051.80	0.272	0.510	0.577	2.70	
1,051.90	0.276	0.538	0.590	0.55	
1,052.00	0.279	0.565	0.696	0.50	
1,052.10	0.283	0.594	1.063	0.40	
1,052.20	0.286	0.622	1.486	3.45	
1,052.30	0.290	0.651	1.951	1.50	
1,052.40	0.294	0.680	2.457	3.05	
1,052.50	0.297	0.709	2.999	0.90	
1,052.60	0.301	0.739	3.576	0.75	
1,052.70	0.305	0.770	4.189	0.35	
1,052.80	0.308	0.800	4.838	0.20	
1,052.90	0.312	0.831	5.508	0.30	
1,053.00	0.316	0.863	6.214	0.20	
1,053.10	0.320	0.895	6.942	0.15	
1,053.20	0.324	0.927	7.695	0.15	
1,053.30	0.328	0.959	8.478	0.10	
1,053.40	0.332	0.992	9.287	0.05	
1,053.50	0.336	1.026	10.117	0.10	
1,053.60	0.340	1.060	10.971	0.15	
1,053.70	0.344	1.094	11.847	0.05	
1,053.80	0.349	1.128	12.645	0.10	
1,053.90	0.353	1.164	12.929	0.05	
1,054.00	0.357	1.199	13.212	0.05	Spillway #2
1,054.03	0.358	1.209	13.408	0.05	Peak Stage
1,054.10	0.361	1.235	13.933		
1,054.20	0.366	1.271	15.107		
1,054.30	0.370	1.308	18.004		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
1,054.40	0.374	1.345	18.721	
1,054.50	0.379	1.383	19.439	
1,054.60	0.383	1.421	29.282	
1,054.70	0.388	1.460	32.960	
1,054.80	0.392	1.499	37.935	
1,054.90	0.396	1.538	42.847	
1,055.00	0.401	1.578	48.694	
1,055.10	0.406	1.618	54.651	
1,055.20	0.411	1.659	61.017	
1,055.30	0.415	1.700	67.786	
1,055.40	0.420	1.742	74.953	
1,055.50	0.425	1.784	82.516	
1,055.60	0.430	1.827	90.806	
1,055.70	0.435	1.870	99.522	
1,055.80	0.440	1.914	108.662	
1,055.90	0.445	1.958	118.227	
1,056.00	0.450	2.003	128.216	
1,056.10	0.455	2.048	138.630	
1,056.20	0.460	2.094	149.464	
1,056.30	0.465	2.140	160.715	
1,056.40	0.470	2.187	172.395	
1,056.50	0.475	2.234	184.504	

Detailed Discharge Table

Elevation (ft)	Straight Pipe (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
1,049.64	0.000	0.000	0.000
1,049.70	0.000	0.000	0.000
1,049.80	0.000	0.000	0.000
1,049.90	0.000	0.000	0.000
1,050.00	0.000	0.000	0.000
1,050.10	0.000	0.000	0.000
1,050.20	0.000	0.000	0.000
1,050.30	0.000	0.000	0.000
1,050.40	0.000	0.000	0.000
1,050.50	0.000	0.000	0.000
1,050.60	0.000	0.000	0.000
1,050.70	0.000	0.000	0.000
1,050.80	0.000	0.000	0.000
1,050.90	0.000	0.000	0.000

Elevation (ft)	Straight Pipe (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
1,051.00	0.000	0.000	0.000
1,051.10	0.000	0.000	0.000
1,051.20	0.000	0.000	0.000
1,051.30	0.000	0.000	0.000
1,051.40	0.000	0.000	0.000
1,051.50	0.000	0.000	0.000
1,051.60	0.000	0.000	0.000
1,051.70	0.000	0.000	0.000
1,051.80	(3)>0.577	0.000	0.577
1,051.90	(3)>0.590	0.000	0.590
1,052.00	(3)>0.696	0.000	0.696
1,052.10	(3)>1.063	0.000	1.063
1,052.20	(3)>1.486	0.000	1.486
1,052.30	(3)>1.951	0.000	1.951
1,052.40	(3)>2.457	0.000	2.457
1,052.50	(3)>2.999	0.000	2.999
1,052.60	(3)>3.576	0.000	3.576
1,052.70	(3)>4.189	0.000	4.189
1,052.80	(3)>4.838	0.000	4.838
1,052.90	(3)>5.508	0.000	5.508
1,053.00	(3)>6.214	0.000	6.214
1,053.10	(3)>6.942	0.000	6.942
1,053.20	(3)>7.695	0.000	7.695
1,053.30	(3)>8.478	0.000	8.478
1,053.40	(3)>9.287	0.000	9.287
1,053.50	(3)>10.117	0.000	10.117
1,053.60	(3)>10.971	0.000	10.971
1,053.70	(3)>11.847	0.000	11.847
1,053.80	(3)>12.645	0.000	12.645
1,053.90	(2)>12.929	0.000	12.929
1,054.00	(2)>13.212	0.000	13.212
1,054.10	(1)>13.495	0.438	13.933
1,054.20	(1)>14.231	0.876	15.107
1,054.30	(5)>16.690	1.314	18.004
1,054.40	(5)>16.970	1.752	18.721
1,054.50	(5)>17.249	2.189	19.439
1,054.60	(5)>17.529	11.753	29.282
1,054.70	(6)>17.809	15.151	32.960
1,054.80	(6)>18.089	19.846	37.935
1,054.90	(6)>18.368	24.478	42.847
1,055.00	(6)>18.629	30.064	48.694

Elevation (ft)	Straight Pipe (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
1,055.10	(6)>18.799	35.852	54.651
1,055.20	(6)>18.970	42.047	61.017
1,055.30	(6)>19.140	48.646	67.786
1,055.40	(6)>19.310	55.643	74.953
1,055.50	(6)>19.481	63.036	82.516
1,055.60	(6)>19.651	71.155	90.806
1,055.70	(6)>19.821	79.701	99.522
1,055.80	(6)>19.992	88.671	108.662
1,055.90	(6)>20.162	98.065	118.227
1,056.00	(6)>20.332	107.884	128.216
1,056.10	(6)>20.502	118.128	138.630
1,056.20	(6)>20.666	128.798	149.464
1,056.30	(6)>20.820	139.895	160.715
1,056.40	(6)>20.975	151.420	172.395
1,056.50	(6)>21.129	163.374	184.504

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	12.700	0.057	0.000	0.000	81.000	F	16.14	4.008
	2	0.500	0.001	0.000	0.000	100.000	F	0.77	0.246
	Σ	**13.200**						**16.91**	**4.254**

Subwatershed Sedimentology Detail:

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
#1	1	0.240	200.00	22.50	0.9000	1.0000	2	1,256.6	349,169	267.43	158.63
	2	0.001	100.00	0.01	0.0001	1.0000	1	0.0	0	0.00	0.00
	Σ							**1,256.6**	**335,348**	**256.84**	**150.92**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	5.00	5.00	100.00	2.230	0.012
		8. Large gullies, diversions, and low flowing streams	8.85	130.00	1,469.00	8.920	0.045
#1	**1**	**Time of Concentration:**					**0.057**